

# Module III

## Routine Operations

### OBJECTIVES

1. Understand the requirements of DOE 5480.19 regarding routine shift operations at DOE facilities and associated impact on safety and efficiency of operations. (1.b)
2. Refer to a copy of DOE 5480.19, Attachment I, and locate applicable guidelines and requirements for specific activities. (1.a)

DOE 5480.19, Attachment I, Chapters 2, 3, 4, 11, 12, and 13 have been combined to make up the Routine Operations section.

### I. Chapter Summaries

#### A. Chapter 2: Shift Routines and Operating Practices

This chapter describes some important aspects of routine shift activities and watchstanding practices that promote the professional conduct of operations personnel and result in meeting DOE and facility management expectations for operator performance. Professional conduct and good watchstanding practices result in appropriate attention to facility conditions, a necessary part of maintaining a safe and effective operational environment. Key elements are: effective equipment monitoring to detect abnormal conditions or adverse trends, notifying supervisors promptly of unusual or unexpected situations, understanding equipment status and operational authority, and following proper industrial safety, radiological protection (if applicable) and quality assurance practices.

The chapter specifically provides guidelines for status practices, safety practices, operator inspection tours, use of round/tour inspection sheets, personnel protection, response to indications, resetting protective devices, load changes, authority to operate equipment, shift operating bases, and potentially distractive written material and devices.

B. Chapter 3: Control Area Activities

This chapter recognizes the control area or control room as the most critical facility operating base and the coordination point for all important facility activities. It stresses principles involving limited control area access, professional behavior of personnel in the control area, monitoring of main control panels, control operator ancillary duties, and operation of control area equipment. Errors and unnoticed equipment problems occur if formality and attention to detail is not practiced by operators in the control room.

C. Chapter 4: Communications

This chapter describes the important aspects of a plant program for audible communications and emphasizes that accurate communications are essential for the safe and efficient operation of facilities. Audible communications are used to transmit operating and emergency information within the facility. Examples are oral (face-to-face), telephone, radio, public address (page) announcements, sound powered phones, and special sounds (horns and bells). Guidance provided includes the practice of repeating back instructions to ensure accurate transmission and receipt of verbal instructions, use of standardized terminology, and use of a phonetic alphabet. Inadequate communication is a common root cause behind operator error. On the softer side, personnel morale, which can indirectly affect facility efficiency and safety (consider incidents of sabotage, equipment tampering, and malicious compliance), depends on open, honest and clear communications.

D. Chapter 11: Logkeeping

This chapter describes the features needed in the operation logs to ensure they are properly maintained. Operations logs should be established for all key shift positions and should contain a narrative of the facility's status and all events as required to provide an accurate history of facility operations. Proper logkeeping is essential to the safe and efficient operation of a facility because it provides the data

necessary for the reconstruction of abnormal or unusual events. When the data is properly analyzed and corrective actions are taken, subsequent recurrence of the event should be prevented. Logkeeping also promotes personal accountability and improved communication of information about the facility's status among operating personnel.

**E. Chapter 12: Operations Turnover**

This chapter describes the important aspects of a good shift turnover. The comprehensive transfer of information pertinent to the operation of the facility is vital to safe and efficient operations, as evidenced by a historically high error rate associated with poor shift turnovers resulting from improper reviews of logs, unclear communications and neglecting to discuss key operating parameters and status. Safe operations also depend on operating personnel being fit for duty. Therefore, it is also the responsibility of the off-going person to determine this by looking for evidence of sickness with corresponding degradation of mental or physical ability to do the job due to the sickness itself and/or the effects of medication the person might be taking. Other compromising conditions such as drug and alcohol abuse should also be considered among the things to look for.

**F. Chapter 13: Operations Aspects of Facility Chemistry and Unique Processes**

This chapter describes the important aspects of operations involving chemistry and unique processes and their relationship to safe and efficient facility operation. Operational monitoring of facility chemistry or unique process data and parameters should ensure that parameters are properly maintained. Proper monitoring will identify problems before components or safety are adversely affected. Operating personnel must be knowledgeable about the chemicals and processes they are working with and depending upon so that they can detect and correct off-normal parameters in a timely manner.

## II. Chapters and Guidelines Review

These chapters assist management in establishing a professional atmosphere by ensuring appropriate attention to facility operating conditions.

- A. **Shift Routines and Operating Practices:** Establishes the overall framework for single and multi-shift operations.

(The following explanations provide a summary for each of the guidelines. Refer to Attachment 1 of DOE 5480.19 if more detail is needed for a specific guideline.)

1. **Status Practices:** Operators and supervisors should keep each other informed of all aspects of facility status in a timely manner.
2. **Safety Practices:** Operations personnel should adhere to the requirements of the facility industrial safety program.
3. **Operator Inspection Tours:** Operator tours should be of sufficient detail to ensure that the status of equipment is known. Each operator should conduct a thorough tour of all areas within his/her responsibility, making appropriate equipment inspections at designated times at least once per shift. Operators should take appropriate action to correct or report deficiencies noted during tours.
4. **Round/Tour Inspection Sheets:** Round inspection sheets are an effective method for providing operators with guidance on the extent to which equipment and areas should be inspected during routine tours.
  - Maximum/minimum values or expected operating ranges should be included to enable operators to recognize abnormal readings quickly.

- Safety limits derived from Technical Specifications or Operational Safety Requirements should be highlighted. Parameters exceeding the specified maximum/minimum values should be circled or otherwise highlighted on the round sheet and promptly reported to the control room and/or the cognizant operations manager. The causes of abnormal indications should be promptly investigated with supervisors becoming involved as appropriate.
5. **Personnel Protection:** Adhere to all posted personnel protection requirements and observe proper practices and precautions while in controlled areas.
  6. **Response to Indications:** Operators should believe instrument readings and treat them as accurate unless proven otherwise. In general, operators should check other indications, if possible, when unexpected readings are observed. Prompt action should be taken to investigate the cause of abnormal or unexpected indications so that prompt corrective action can occur.
  7. **Resetting Protective Devices:** When protective devices trip, an attempt should be made to understand the cause of the trip before the device is reset. The operations manager should provide the appropriate guidance so that tripped protective devices will be properly addressed.
  8. **Load Changes:** Operators and supervisors should be aware of, and keep each other informed of facility load changes.

9. **Authority to Operate Equipment:** The overall operation of the facility should be directed by the operations supervisor for a large DOE facility or by the cognizant manager for a test and research facility. Operations management should ensure that only trained and qualified personnel operate plant equipment.
  10. **Shift Operating Bases:** A facility area where an operator returns when not performing plant duties. Each position should have a base and it should be equipped with appropriate office equipment for conducting administrative duties, current and necessary procedures and references, as well as communication equipment. Shift turnover is typically conducted here.
  11. **Potentially Distractive Written Material and Devices:** Written material that does not relate to operation and entertainment devices (such as radios, televisions, tape players, and computer games) should be prohibited from use by on-duty operations personnel in order to minimize distractions from their responsibilities.
- B. **Control Area Activities:** Establishes an increased level of formality over that required of shift routines. (The guidelines are intended for facilities that use centralized controls and communications.)
- (The following explanations provide a summary for each of the guidelines. Refer to Attachment 1 of DOE 5480.19 if more detail is needed for a specific guideline.)
1. **Control Area Access:** Control area access should be limited to those persons on official business only. The "at-the-controls" area of the control room should be clearly identified, and its boundary should be understood by all persons who are granted access to the control room. Entry into this area should be granted by designated individuals, and persons who might need to enter this area should know who can

grant access.

2. **Professional Behavior:** Professional behavior should be displayed in the control area at all times.
3. **Monitoring the Main Control Panels:** Operators should be alert and attentive to control panel indications and alarms. Control panel indications should be monitored frequently, and prompt action should be taken to determine the cause of and correct abnormalities. The number of evolutions affecting control panel indications that are performed concurrently should be limited so that the operator's ability to detect and respond to abnormal conditions will not be compromised.
4. **Control Operator Ancillary Duties:** Duties assigned to operators should not interfere with their ability to monitor facility parameters. Activities such as preparation of tagging orders, reviews of operating procedures, required reading, and review of maintenance work activities should not comprise a major portion of these operators' shift responsibilities.
5. **Operation of Control Area Equipment:** Only specifically authorized persons operate control area equipment. Trainees operating the equipment are supervised by an authorized operator.

- C. **Communications:** Establishes formal normal and emergency communications protocol for process safety and control.

(The following explanations provide a summary for each of the guidelines. Refer to Attachment 1 of DOE 5480.19 if more detail is needed for a specific guideline.)

1. **Emergency Communications Systems:** Methods should be implemented to ensure all facility personnel are promptly alerted to facility emergencies.
2. **Public Address System:** Use of the facility public address system (page) should be administratively controlled to ensure it retains its effectiveness in contacting plant personnel. Excessive use of the public address system for paging of personnel and unnecessary announcements should be avoided because excessive use can reduce the impact of important announcements and can be distracting.
3. **Contacting Operators:** Methods should be implemented to ensure that control areas can quickly contact on-shift operators or supervisors.
4. **Radios:** Radio can be an effective means of mobile, point to point communications. However, radio usage should not be allowed in areas where electronic interference with plant equipment may result. Areas where radio use is prohibited should be delineated. Instructions regarding frequencies (channels) and postings should be provided.
5. **Abbreviations and Acronyms:** Only abbreviations and acronyms obtained from an approved list should be used in facility communications.
6. **Oral Instructions and Informational Communications:** Oral instructions should be clear and concise. In all communications, the sender and intended receiver should be readily identifiable.



- D. **Logkeeping:** Establishes formal records for process control and event reconstruction.

(The following explanations provide a summary for each of the guidelines. Refer to Attachment 1 of DOE 5480.19 if more detail is needed for a specific guideline.)

1. **Establishment of Operating Logs:** Narrative logs should be established at all key shift positions. A narrative section should be provided on round sheets when a narrative log is not used for a particular shift position.
2. **Timeliness of Recordings:** Information is promptly recorded in logs to prevent incomplete or inaccurate entries due to delays.
3. **Information to be Recorded:**
  - Facility mode or condition changes (e.g., shutdown, operations, run, startup, refueling, etc.);
  - Criticalities and appropriate critical data (for DOE reactors);
  - Abnormal facility configurations;
  - Status changes to safety-related and other major facility equipment;
  - Occurrence of any reportable events;
  - Initiation and completion of surveillance tests;
  - Entering and exiting operational limit actions;
  - Security incidents;
  - Out-of-specification chemistry or process results; and
  - Shift relief.
4. **Legibility:** Log entries are easily read, and understood and readily reproducible (photocopy).

5. **Corrections:** The method chosen should not obscure the incorrect entry. Log entries should not be erased or covered up.
  6. **Log Review:** Control area logs should be reviewed periodically by the operations supervisor and logs kept by operators outside the control area should be reviewed by the control area operator or an appropriate supervisor.
  7. **Care and Keeping of Logs:** Written guidance exists which provides for availability, retrieval, and long-term preservation of logs.
- E. **Operations Turnover:** Establishes a formal procedure to ensure that multi-shift facilities continue safe, efficient operations while changing personnel.
- (The following explanations provide a summary for each of the guidelines. Refer to Attachment 1 of DOE 5480.19 if more detail is needed for a specific guideline.)
1. **Turnover Checklists:** As a minimum, supervisory positions should have a turnover checklist to be used in the turnover process.
  2. **Equipment Operator Checklists Operator Checklists:** Operator checklists or other documents reviewed at shift change should provide for recording vital information about the following facility status:
    - Facility power level, test status, or equivalent;
    - Safety equipment status;
    - Operational limits in effect;
    - Maintenance, surveillance, tests, or evolutions (in progress or planned);
    - Problems experienced with equipment and major equipment out of service;

- Changes in radiological or hazardous materials conditions; and
  - Temporary procedure changes in effect.
3. **Operations Supervisory Checklists:** Operations supervisory checklists or other documents reviewed at shift change should provide vital information about facility status. Supervisory checklists should contain information similar to, but more comprehensive than, operator checklists.
  4. **Document Review:** Document review should be as intensive as necessary for the oncoming personnel to understand important history, present status, and planned events. Normally, narrative log entries for the previous 24-hour period or since his/her last shift should be reviewed.
  5. **Control Panel Walkdown:** Walkdowns of appropriate control panels should be conducted by each shift watchstander. The purpose of a panel walkdown is to determine plant status through observation of system lineups, switch positions, lighted annunciators, chart recorders, and status lights.
  6. **Discussion and Exchange of Responsibility:** When all operations personnel are satisfied that the oncoming crew is fully cognizant of plant conditions, the oncoming operators and supervisors state they are assuming responsibility for the position with a log entry.
  7. **Shift Crew Briefing:** The briefing should include a review of the status, problems with equipment, and evolutions in progress or planned during the shift.

8. **Reliefs Occurring During the Shift:** Turnover should be commensurate with the oncoming persons' familiarity with plant conditions.

- F. **Chemistry and Unique Processes:** ensures operators understand process parameters and are able to take appropriate measures to control the process.

(The following explanations provide a summary for each of the guidelines. Refer to Attachment 1 of 5480.19 if more detail is needed for a specific guideline.)

1. **Operator Responsibilities:** Operators should monitor chemistry or process parameters using control room instruments and other instruments related to equipment under operations control. Operators should recognize out of specification readings or adverse trends and are familiar with corrective actions. Operators should consult with chemistry or technical process personnel.
2. **Operator Knowledge:** Operators should be knowledgeable about aspects of facility processes and safety that affect operation, and they should be able to analyze off-normal situations and take appropriate corrective action.
3. **Operator Response to Process Problems:** Each operator should be capable of correctly interpreting chemistry or process parameters under their responsibility and take timely, appropriate corrective action when required.
4. **Communication Between Operations and Process Personnel:** Operators should inform process personnel prior to commencing evolutions which can affect processes. Operators receive reports from process personnel on key day-to-day process results and/or problems.

### References and Suggested Reading

DOE 5480.19

Chapter 2	Shift Routines
Chapter 3	Control Area Operations
Chapter 4	Communications
Chapter 11	Logkeeping
Chapter 12	Operations Turnover
Chapter 13	Chemistry and Unique Processes

DOE-STD-1041-93 Guide to Good Practices for Shift Routines and Operating Practices

DOE-STD-1042-93 Guide to Good Practices for Control Area Activities

DOE-STD-1031-92 Guide to Good Practices for Communications

DOE-STD-1035-93 Guide to Good Practices for Logkeeping

DOE-STD-1038-93 Guide to Good Practices for Operations Turnover

DOE-STD-1037-93 Guide to Good Practices for Operations Aspects of Unique Processes

DOE-EM-STD-5505-96 Operations Assessments

## Module III Requirements Exercise

### Exercise

Answer the following questions using DOE 5480.19:

*Please see the end of this module for solutions/explanations.*

1. What actions/observations does an operator take/make during an inspection tour?
2. What should an operator do prior to resetting a protective device?
3. What is the difference between a round sheet and a log?
4. Who would be responsible for increasing the rate at which an evaporator processes water?
5. What is a "shift operating base"?

6. Who is responsible for determining what is potentially distracting written material and devices?
7. What is the difference between the control area and the "at the controls" area?
8. Why should the facility public address system be administratively controlled?
9. With respect to logkeeping requirements, what is a "key shift position"? Is it defined?
10. Are logs required to be retained?
11. How are logs corrected?

## Conduct of Operations

U.S. Department of Energy, Albuquerque Operations Office

### 3. Routine Operations

12. Who is responsible for reviewing logs?
13. What should the overall objective be when conducting a shift-crew briefing?
14. At what point should an on-coming operator or supervisor state that they have assumed responsibility for the shift position?
15. What type of information should be contained on a shift turnover checklist? Give specific examples.
16. Should operators be responsible for monitoring trends of key process parameters? Explain briefly.



## Requirements Exercise Solutions

1. What actions/observations does an operator take/make during an inspection tour?

**(pg. I-20, Ch. 2, guideline 3)**

***In general, there should be sufficient action to ensure that the status of equipment is known. Equipment should be inspected to ensure that it is operating properly or is capable of operating properly. Some things to do include:***

***Note status of equipment: Status checked (operating, standby, maintenance in progress) so the operator is reminded of the exact facility status.***

***Note abnormal conditions: Components such as breakers, alarms, electrical panels are checked for abnormal conditions and are reported when such a condition is found. Also, alarms and warning light on equipment is checked for abnormal conditions.***

***Report and Correct: Inspect, report, and correct deficiencies such as housekeeping, cleanliness, inoperative lighting, radiological problems, or leaks.***

2. What should an operator do prior to resetting a protective device?

**(pg. I-23, Ch. 2, guideline 7)**

***Normally, before action is taken, the operator should attempt to identify the cause of the trip as well as ensuring no abnormal condition exist that would preclude the device from being reset. Management is expected to provide guidance on the correct actions to be taken when protective devices trip.***

3. What is the difference between a round sheet and a log?

**(pg. I-21, Ch. 2, guideline 4 and pg. I-72, Ch. 11, guideline 1)**

***Round sheet: An official document that formalizes where and what an operator does when conducting an inspection tour. It provides an effective method for providing operators with guidance on the extent to which equipment and areas should***

***be inspected during routine tours. It records key equipment parameters and provides a record of equipment performance that permits short-term trending by operators. Typically it will include a list of equipment and parameters to be monitored and recorded by the operator.***

***Log: Specifically called a "narrative log" in 5480.19. It can be part of a round sheet or it can stand alone. It is a chronological recording of events by an operator. Logged events are expected to be recorded promptly to minimize incomplete or inaccurate entries.***

4. Who would be responsible for increasing the rate at which an evaporator processes water?

***(pg. I-24, Ch. 2, guideline 8)***

***The shift supervisor, control-room lead operator, or cognizant manager. This is a load change.***

5. What is a "shift operating base"?

***(pg. I-24, Ch. 2, guideline 10)***

***It is the facility area to which operators return when they are not performing in-plant duties. It is determined for each shift position and should be equipped so that operators can perform all duties and responsibilities.***

6. Who is responsible for determining what is potentially distracting written material and devices?

***(pg. I-25, Ch.2, guideline 11)***

***Management must define what is/are potentially distracting written material and devices.***

7. What is the difference between the control area and the "at the controls" area?

**(pg. I-27, Ch. 3, discussion and guidelines 1 and 4)**

**Control Area: the most critical facility operating base and the coordination point for all important facility activities.**

**Synonymous with control room.**

**At the Controls Area: It is never defined. CONOPS**

**Interpretation: It is an area in the control area/room where an operator is actually assigned to monitoring and controlling plant equipment and communications. In addition, the at the controls area is located in the control area/room and delineates an area of increased formality over the normal formality of the control room. The increased formality is necessary because the operations that are monitored and controlled in the area are considered to be critical to the facilities operation and nothing should distract the operator's ability to operate safely.**

8. Why should the facility public address system be administratively controlled?

**(pg. I-30, Ch. 4, guideline 2)**

**To ensure that it retains its effectiveness in contacting plant personnel. Excessive use can reduce the impact of important announcements and can be distracting.**

9. With respect to logkeeping requirements, what is a "key shift position"? Is it defined?

**(pg. I-72, Ch. 11, guideline 1)**

**It is not defined but narrative logs will be kept for key shift positions.**

**CONOPS Interpretation: The next sentence states that narrative logs should be maintained by the operations supervisor or the control area operator, so by inference they are key shift positions. In general, it is presumed that they would be defined by management when management determined that a narrative log was important enough to be maintained.**

10. Are logs required to be retained?

**(pg. I-74, Ch. 11, guideline 7)**

***Management is expected to provide written guidance on the disposition of completed logs. Some requirements include:***

- . Logs are available for review by operators who have been absent.***
- . Logs are stored to ensure that they are available for the expected life of the facility.***
- . Logs can be retrieved if necessary.***

11. How are logs corrected?

**(pg. I-74, Ch. 11, guideline 5)**

***A standard method for correcting erroneous entries should be established. The method chosen should not obscure the incorrect entry. Log entries should not be erased or covered up. Corrections can be made by placing a single line through the incorrect entry and writing the correct entry in a nearby space. All corrections should be initialed and dated.***

12. Who is responsible for reviewing logs?

**(pg. I-74, Ch. 11, guideline 6)**

***Control area logs should be reviewed periodically by the operations supervisor. Logs kept outside of the control area should be reviewed by the control room operator.***

***CONOPS Interpretation: All narrative logs should be reviewed by first-line supervisors to ensure that prescribed logkeeping procedures are implemented by operators. The control area log (or the central master log) should be reviewed by the facility manager and operations supervisor to ensure they know what is occurring in their facility.***

13. What should the overall objective be when conducting a shift-crew briefing?

**(pg. I-78, Ch. 12, guideline 5)**

***To ensure that ALL personnel understand work priorities and objectives.***

14. At what point should an on-coming operator or supervisor state that they have assumed responsibility for the shift position?

**(pg. I-78, Ch. 12, guideline 4)**

***When all operations personnel are satisfied that the on-coming crew is fully cognizant of plant conditions, the on-coming operators and supervisors should state that they are assuming responsibility for the shift position with an entry into their logs.***

15. What type of information should be contained on a shift turnover checklist? Give specific examples.

***Give specific examples. (pg. I-75, Ch. 12, guideline 1)***

***Depends on the checklist. Refer to the guideline.***

16. Should operators be responsible for monitoring trends of unique process parameters? Explain briefly.

**(pg. I-79, Ch. 13, guidelines 1, 2 & 3)**

***By monitoring key parameters and taking appropriate action promptly, long-term adverse effects of chemistry or process problems can be avoided or minimized.***

***To provide appropriate and timely corrective action when required.***

***CONOPS Interpretation: These guidelines require that operators understand how the part of the process for which they are responsible interacts with the rest of the process. When adverse trends occur, operators should understand how the process is affected and take appropriate corrective action.***